

SUPPLEMENTAL PRELIMINARY AMENDMENT

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Serial No.: 10/044,479

Issue Date: January 11, 2002

Attorney Docket No. 125.028USR1

Title: MULTI-PHASE CONVERTER WITH BALANCED CURRENTS

REMARKS

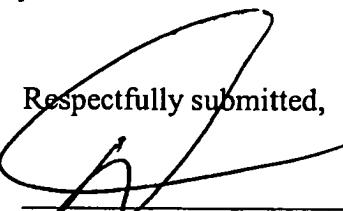
Claims 19–22 have been amended to clarify a typographical error regarding reference signals. More specifically, the amendments clarify the use of first and second reference signals and the common error signal. An example of a first and second reference signal is shown in Figure 2 of the present application. In particular, in the example shown in Figure 2, a first reference signal is coupled to input 42a of the error amplifier and a second reference signal is coupled to an input 68b, 70b, 72b and 74b of an associated pulse width modulator. Further, the naming of the error signal has been amended for purposes of clarification as shown, for example, in Figure 2.

Claims 23–42 have been added, the currently pending claims are claims 1–42. Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 312-2201.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 501373.

Respectfully submitted,

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MARKED UP VERSION OF AMENDED CLAIMS

19. (Amended) A method of balancing a plurality of channel currents, each of the plurality of channel currents flowing in a corresponding one of a plurality of channels in a multi-phase DC/DC converter, the DC/DC converter having an output voltage, the method comprising:

receiving a plurality of channel current signals, each of the plurality of channel current signals representative of a channel current for one of the plurality of channel currents;

averaging together the plurality of channel current signals to thereby determine an average channel current signal;

comparing a signal representative of the output voltage to a first reference signal to thereby determine [an] a common error signal; and

controlling each of the channel currents based at least in part on the average channel current signal, one of the plurality of channel current signals, a second reference signal and the common error signal.

20. (Amended) The method of claim 19, wherein controlling the channel currents comprises:

generating a plurality of pulse width modulated signals for the plurality of channels to selectively control the channel currents, each of the plurality of pulse width modulated signals based at least in part on the average channel current signal, one of the plurality of channel current signals, the second reference signal and the common error signal.

21. (Amended) The method of claim 19, wherein the second reference signal comprises a ramp signal.

22. (Amended) A control circuit for a multi-phase DC/DC converter having an output voltage, the control circuit comprising:

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~~an averaging circuit, responsive to a plurality of channel current signals representative of channel currents for a plurality of channels, that averages the values of the plurality of channel current signals to produce a signal representative of the average channel current;~~

~~an error amplifier, responsive to the output voltage and a reference signal, the error amplifier providing [an] a common error signal; and~~

~~a plurality of pulse width modulator circuits, each responsive to the common error signal, the signal representative of the average channel current, one of the plurality of channel current signals, and a second reference signal to produce a plurality of pulse width modulated signals to control the plurality of channels of the multi-phase DC/DC converter.~~

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